In-out-in technique for acetabular fractures: is it really good?

Sujit Kumar Tripathy · Ramesh Kumar Sen ·
Tarun Goyal

Received: 16 November 2012 / Accepted: 17 November 2012 / Published online: 9 December 2012
© Springer-Verlag Berlin Heidelberg 2012

Dear Editor,

We would like to thank Meena et al. for showing their interest in our article [1]. We believe that the explanations given below should be sufficient respond to their queries.

The lateral femoral cutaneous nerve usually passes beneath the inguinal ligament to supply the lateral part of the thigh. During iliofemoral exposure, the skin incision along the anterolateral part of the thigh should be slightly lateral and over the anterior aspect of the tensor muscle belly. This minimises the cutaneous sensory loss by reducing the number of branches of the lateral cutaneous nerve of the thigh which have to be sacrificed for the exposure. The tensor muscle is retracted laterally and the medial sheath of the tensor fascia along with the sartorius attachment on the anterior superior iliac spine is retracted medially protecting the major trunk (s) of the lateral femoral cutaneous nerve [2]. None of our patients had any symptoms of lateral femoral cutaneous nerve injury.

Transverse fractures of the acetabulum can be fixed with screws or plates depending on their fracture pattern. Simple transverse fractures without any comminution can be fixed with screws alone. In comminuted fractures, plate fixation is needed for better stability. We have treated all of our patients based on this principle and did not notice loss of reduction in any case.

The ‘in-out-in technique’ of anterior column lag screw fixation avoids the middle danger zone of the anterior column. The conventional anterior column lag screw fixation is strictly

intraosseous and thus the minimal diameter of the anterior column should be taken into consideration for screw fixation. The reason why Hong et al. [3] and Chen et al. [4] warn orthopaedic surgeons about anterior column lag screw fixation is because of the minimal bone stock of the anterior column at the centre of the hip joint. Our screw fixation technique selectively avoids this narrow path and remains extraosseous. Shiramizu et al. measured the bone stock of the anterior column at different points. They found the thickness of the anterior column (pelvic brim to the margin of the hip joint) to be 14.0 ± 3.6 mm at the centre of the hip joint, compared to 18.5 ± 4.6 mm in the posterior and 17.2 ± 3.5 mm in the anterior half of the hip joint [5]. The final purchase of the lag screw using our technique remains in a thick strut of bone anteriorly. We could safely place two screws of 4.5 mm diameter in some of our cases because of this thicker bone stock at the anterior part of the anterior column.

The post-operative rehabilitation protocol was based on the fracture pattern, severity of comminution and other associated injuries. In simple uncomminuted fractures, immediate toe-touch weight-bearing was started the next day and continued for 12 weeks. However, in patients with comminuted fractures and associated pelvis or other musculoskeletal injuries, mobilisation was delayed.

Rarely the surgeon has to drill a second time for the screw track while inserting the anterior column lag screw using the in-out-in technique. However, the surgeon must be familiar with the iliofemoral approach before attempting fixation of the screw. Drilling and fixing the screw in the anterior column in our described technique is performed under direct visualisation and the iliopectineal eminence provides the best guide and fulcrum (for the drill) to locate the site of the anterior insertion of the screw. The indications for the proposed screw fixation technique have been clearly described in the article. To achieve a good purchase of fixation, there

---

S. K. Tripathy (✉)
Department of Orthopaedics, Kasturba Medical College,
Manipal 576104, Karnataka, India
e-mail: sujithortho@yahoo.co.in

S. K. Tripathy · R. K. Sen · T. Goyal
Department of Orthopaedics, Postgraduate Institute of Medical
Education and Research, Chandigarh, India 160012

should not be comminution in the iliopectineal eminence. In comminuted fractures, an additional pelvic brim plate is needed.

Fixation of the osteotomised anterosuperior iliac spine to its position is usually performed with two vertically directed 3.5-mm screws. However, in Fig. 5b, only one screw was used because it was fixed from an anterior to posterior direction and was found to be stable.

In osteoporotic individuals, the screw purchase may not be adequate alone and additional fixation should be provided with plates, cables or wires.

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Sen RK, Tripathy SK, Aggarwal S, Goyal T, Meena DS, Mahapatra S (2012) A safe technique of anterior column lag screw fixation in acetabular fractures. *Int Orthop* 36(11):2333–2340. doi:10.1007/s00264-012-1661-z
2. Acetabulum-iliofemoral approach. AO Surgery Reference. <http://www2.aofoundation.org>
3. Hong H, Pan Z, Chen H (2006) An anatomic study of lag screw placement in anterior column of acetabulum and design of targeting device. *Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi* 20(6):651–654
4. Chen KN, Wang G, Cao LG, Zhang MC (2009) Differences of percutaneous retrograde screw fixation of anterior column acetabular fractures between male and female: a study of 164 virtual three-dimensional models. *Injury* 40(10):1067–1072
5. Shiramizu K, Naito M, Yatsunami M (2003) Quantitative anatomic characterisation of the pelvic brim to facilitate internal fixation through an anterior approach. *J Orthop Surg (Hong Kong)* 11(2):137–140